Bandolier
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Evidence-based health care
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LATEX ALLERGY

Implications for patients and health care workers

The first report of allergic reactions to rubber appeared in 1979. Why have people become sensitive to latex? The use of latex medical products like gloves increased tremendously during the 1980s to reduce possible exposure to infected patients or body fluids. This sudden increase in demand for latex, especially gloves, meant that new manufacturers emerged, that new industrial processes evolved, and that perhaps new or subtly different sources of raw material were used. Products used today may have higher concentrations of allergens as a result of some or all of these changes, or new latex allergens may have been created.

Occupational exposure is widespread. About one million people work in the NHS, and many are exposed to latex. As well as medical and dental personnel, and rubber industry workers, the need to avoid body fluid contact extended exposure to other areas of society. Police officers now routinely use latex gloves when dealing with injured people. Even criminals use latex gloves to avoid leaving fingerprints.

Those receiving health care are also exposed. Patients having operations are obviously exposed to latex. Perhaps less obvious but just as important are dental and anal or vaginal examination.

What is Latex?

Latex describes either the sap of the Brazilian rubber tree (*Hervea brasiliensis)* or products made by dipping forms into the sap (gloves, balloons, condoms). Allergic reactions are against proteins naturally present (1%) in liquid latex. Which particular protein is the problem is unclear; one with molecular weight 14,600 is favourite.

The industrial processes of vulcanisation alter proteins. At least one allergen has been found in latex gloves that was not present in rubber sap. The normal source material for medical products is ammoniated latex; the processes include heating to 130 C for 30 minutes in the final phase of glove manufacture. The allergens can be leached from the finished product and are found in the corn starch powder present in medical-use gloves. This powder becomes airborne easily, and inhalation may be one source of contact with latex.

Do many products contain latex?

Yes. Imagine creating an operating room (OR) and an operation without latex products. Some American hospitals now offer latex-free ORs. Some products may be much more of a problem than others. In medicine gloves are the biggest single problem. For some individuals, health care workers or patients, *any* contact with latex can be life-threatening.

What is latex sensitivity?

There are three different types of reactions to natural rubber latex. They are irritation, delayed hypersensitivity (allergic contact dermatitis) and immediate hypersensitivity (anaphylactic symptoms). Irritation is classed as a non allergic condition. The irritated skin is dry and crusty, and the symptoms resolve when contact with latex ceases.

Delayed hypersensitivity presents as skin becoming dry, crusty and leathery with eruptions appearing as sores and blisters. This response occurs between six and 48 hours after contact. Repeated latex exposure causes the skin condition to expand beyond the area of contact. Many people with delayed hypersensitivity have a history of atopy (allergy, dermatitis, or asthma).

Immediate hypersensitivity is an allergic response mediated by IgE (an antibody found in the circulation). On the skin this can present hives that migrate beyond the point of contact with latex. Systemic allergic symptoms can include itching eyes, swelling of lips or tongue, breathlessness, dizziness, abdominal pain, nausea, hypotension, shock and, potentially, death. These symptoms are likely to result from a massive release of histamine at a local or whole body level. This results from binding of the latex allergen to sensitised receptors on mast cells.

Are there tests for latex allergy?

Yes. There are several available. **Skin-prick testing** is often thought to be the 'gold standard' of sensitivity testing. Latex is introduced into the skin in small quantities at a pin-prick site. Positive results are swelling or reddening of the skin, and these can be graded according to size. Skin-prick testing is thought by some to be dangerous, particularly intradermal injection, because of the possibility of life threatening anaphylactoid reactions. Testing has to be performed with the allergen against which the patient is allergic. The different types of available allergen extracts may not contain the particular allergen.

There are also safer **in vitro** tests. A blood sample is taken and tested for the presence of IgE antibodies specific to latex. There are a number of tests from different manufacturers who may use different latex extracts. Processes which link allergen proteins using amino groups give very good results compared with skin-prick testing. In one study, of 52 skin-prick latex positive patients, 50 were positive by blood tests [1]. The excellent results now possible with blood tests, their relative low cost and freedom from the danger of immediate hypersensitivity associated with skin-prick testing makes them the method of choice, though there may be differences between manufacturers in kit quality.

Studies which have used **immunoassays** to detect latex-specific IgE have been reviewed critically [1]. Skin and serological testing have been compared directly, and either may be used as a reliable method of diagnosing latex allergy [2].

There is one note of caution. Certain fruits (banana, avocado, chestnut and kiwi fruit) appear to cross-react with latex in allergy testing. These food allergies are extremely rare, and cannot account for the large number of positive reactors in exposed and atopic individuals. The clinical significance of cross-reaction is unknown, but people with cross-reacting IgE antibodies (e.g. food allergy to chestnut) may react when exposed to latex, and vice-versa.

How many health care workers are affected?

As latex allergy has become more widely recognised as an occupational health problem the studies have become bigger and better. Recently 224 hospital employees [3] were interviewed and skin-prick tests performed to six common allergens, one non-latex synthetic glove extract and four different latex glove extracts.

There were 136 nurses, 41 laboratory technicians, 13 dental staff, 11 physicians, 6 respiratory therapists and 17 housekeeping and clerical workers. All tested negative for the non latex glove but 38 (17%) tested positive for latex extracts. The incidence in the different groups was :

Group	% Positive for Latex
All subjects	17
Nurses	18
Laboratory technicians	21
Dental personnel	38
Respiratory therapists	17
Physicians	9
Housekeepers & Clerical	0

Those who were latex positive had significantly higher incidence of bronchial asthma, reported significantly more symptoms when using latex gloves (urticaria, rash, itching, sneezing, nasal congestion, itchy watery eyes and cough), and were significantly more likely to test positive for common allergens (pollen, cat epidermis and dust mites).

The consequences of latex allergy in health workers are not insignificant. Five cases in the USA have been reviewed [4], and give a good picture of the problems at the individual level.

Anecdotal reports in Europe and elsewhere indicate that a number of legal cases involving latex allergy and hospital workers are pending, but the overall clinical relevance to hospital workers needs to be defined.

How many patients are affected?

The only good information is for patients with spina bifida, though there are wide ranges quoted for prevalence. One study of 50 patients aged 2 to 21 years showed that 60% had latex allergy defined by history, serological and / or skin prick tests [5]. This study also showed that allergic patients had undergone significantly more surgical procedures than non-allergic patients (9.5 versus 6.7). In 93 consecutive children with spina bifida [6], 38% were positive for latex antibodies by serological testing and 10% had clinical allergy to latex. The serological test was non-standard, and it may be that this underestimated the prevalence. Using a postal questionnaire of 110 spina bifida children 12% were found to have clinical allergy to latex [7] . Clinical allergy underestimates the presence of IgE antibodies by about four times [6]. It is likely that about 10% of patients with spina bifida will have clinical allergy, and 50-60% will have IgE antibodies specific for latex.

The problem is not confined to spina bifida. Any patient with frequent exposure to latex during surgery is at risk of developing latex sensitivity. The consequences are severe. There is at least one reported case of anaphylactic death after rectal examination with a latex finger stool and FDA reporting has indicated 15 deaths and 400 injuries from latex barium enema tips. There is one documented case of repeated graft rejections caused by latex allergy.

Are there predisposing factors?

569 subjects were examined in a prospective study of risk factors in latex hypersensitivity [8]. There were five groups:-

I	272 non-atopics not exposed to latex
II	73 non-atopics exposed to latex
III	180 atopics not exposed to latex
IV	44 atopic subjects exposed to latex
V	13 subjects with a history of intraoperative anaphylaxis

The results showed that both atopy and exposure to latex increased the likelihood of latex sensitivity, and that the effects were more than additive:-

Group	Atopy	Exposure	Latix positive %
I	0	0	0.37
II	0	+	6.85
III	+	0	9.44
IV	+	+	36.4

All the patients in group V had positive skin prick and serological test for latex; eight were atopic and seven had multiple previous surgical procedures (eight or more). Frequency of exposure to latex raised the likelihood of sensitisation 19-fold in nonatopic subjects and 4-fold in atopic subjects. One third of atopic subjects exposed to latex will have latex sensitivity.

What are the implications for health care?

Latex allergy isn't going to go away. Many people have allergies and the number is growing. They are an at-risk group. A large part of the UK workforce suffers occupational exposure to latex - perhaps as many as one million (4%). Patients are increasingly exposed as all healthcare workers now use gloves.

Latex allergy will become important for health authorities and providers, both for their patients and their employees. There are enormous potential employment and public liability issues. Latex reactions are now notifiable to the FDA, and in the US professional groups and hospitals have developed protocols for dealing with latex issues.

References:

1 DR Ownby, J McCullough. Testing for latex allergy. Journal of Clinical Immunoassay 1993 16: 109-113.

2 KJ Kelly, V Kurup, M Zacharisen, A Resnick, JN Fink. Skin and serological testing in the diagnosis of latex allergy. Journal of Allergy and Clinical Immunology 1993 91: 1140-5.

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5 PI Ellsworth, PA Merguerian, RB Klein, AA Rozycki. Evaluation and risk factors of latex allergy in spinal bifida patients: is it preventable? Journal of Urology 1993 150: 691-3.

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7 ML Pearson, JS Cole, WR Jarvis. How common is latex allergy? A survey of children with myelodysplasia. Developmental Medicine and Child Neurology 1994 36: 64-9.

8 D-A Moneret-Vautrin, E Beaudoin, S Widemer, C Mouton, G Kanny, F Prestat, C Kohler, L Feldmann. Prospective study of risk factors in natural rubber latex hypersensitivity. Journal of Allergy and Clinical Immunology 1993 92: 668-77.

TREATMENT OF DANDRUFF

There is growing, though largely indirect, evidence of a relationship between the yeast *Pityrosporum ovale* and moderate to severe dandruff and seborrheic dermatitis. A number of treatments have become available which treat these relatively common conditions by attacking the causative agent. These include lithium salts, which inhibit small colonies of *P. ovale*, and ketoconazole and other imidazoles which interfere with steroid synthesis in yeasts.

Bandolier sought evidence of effectiveness through a MEDLINE search using the terms DANDRUFF, DERMATITIS-SEBORRHEIC (exploded to all subheadings) and RANDOM*. This revealed four RCTs (three in English) since 1991; references before 1991 were not used.

Lithium succinate ointment

This was a British multicentre double-blind, randomised, placebo-controlled study of an ointment containing 8% lithium succinate (Efalith) compared with base ointment. The study [1] was designed to be cross-over, but is also analysed as a parallel design (158 patients) which is somewhat easier to understand. Patients were instructed to apply the ointment sparingly to affected areas twice daily for four weeks.

Using 100 mm visual analogue scales (VAS), patients assessed redness, scaling, greasiness, itching and the overall impression of treatment. All were significantly better with lithium succinate, with redness, scaling and itching being most improved. There was evidence that the effects of treatment extended at least four weeks after stopping.

Imidazole shampoos and creams

A series of good parallel-group, double-blind randomised controlled trials have been conducted.

An Israeli group examined a shampoo containing 1% bifonazole compared with vehicle shampoo in 44 patients with seborrhoea and seborrheic dermatitis [2]. After using the shampoo three times a week for six weeks with two applications of shampoo on each occasion, there were marked and significant improvements in scaling, redness, itching and severity as assessed by a single clinician.

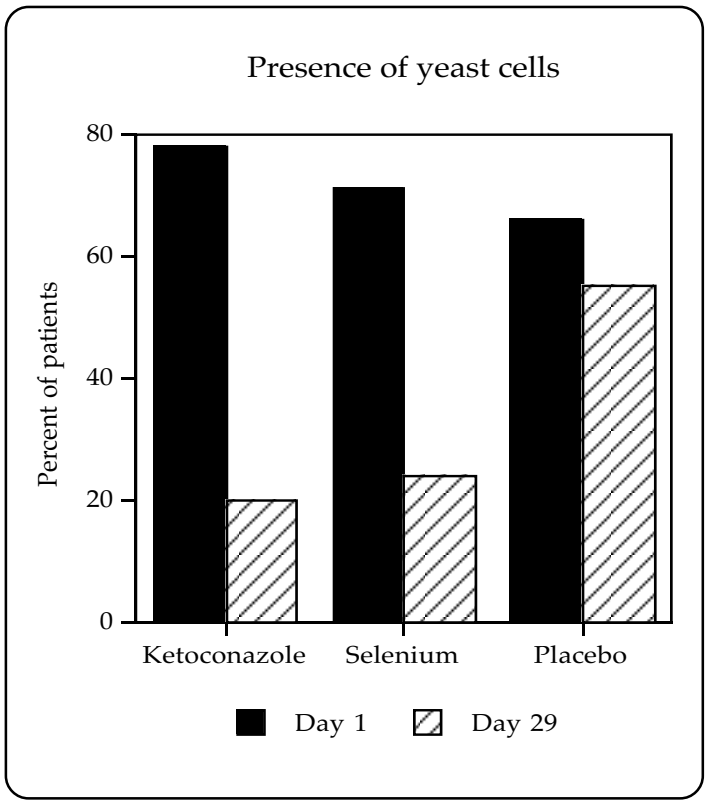
A similar study of 60 patients with a 2% ketoconazole cream (Nizoral) from Germany also showed significant reductions in redness and scaling.

Perhaps the best of the studies was an RCT which compared ketoconazole 2% shampoo with selenium sulphide 2.5% shampoo and placebo in moderate to severe dandruff. This Canadian study [3] involved 246 patients enrolled after a two week period during which they shampooed twice weekly at home with nonmedicated shampoo; enrolment depended upon the assessment of adherent and loose dandruff at six scalp areas.

Treatment was by twice weekly shampooing by a techni-

cian, with clinical assessments at days 1, 8, 15 and 29. The presence of yeast cells was sought by oil immersion microscopy.

Both ketoconazole and selenium sulphide reduced loose and adherent dandruff very significantly over four weeks (by 73% for ketoconazole), and both were much better than placebo. Both also reduced scalp irritation significantly compared with placebo. Ketoconazole reduced the number of patients with yeast cells present from about 80% at the start to 20% at the end of treatment - significantly better than placebo, and somewhat better than selenium sulphide (Figure).



All adverse effects during the treatment phase involved patients treated with selenium sulphide, and although both selenium sulphide and ketoconazole shampoos were effective, ketoconazole appeared to be better tolerated.

References:

1 A double-blind, placebo-controlled, multicenter trial of lithium succinate ointment in the treatment of seborrheic dermatitis. Journal of the American Academy of Dermatology 1992 26: 452-7.

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3 FW Danby, WS Maddin, LJ Margesson, D Rosenthal. A randomised, double-blind, placebo-controlled trial of ketoconazole 2% shampoo versus selenium sulphide 2.5% shampoo in the treatment of moderate to severe dandruff. Journal of the American Academy of Dermatology 1993 29: 1008-12.

GUIDELINES FOR META-ANALYSES
EVALUATING DIAGNOSTIC TESTS

One of the objectives of ***Bandolier*** is to analyse and summarise articles to ease the huge task of the clinician, purchaser, provider - and sometimes, we hope, patient - faced with the huge and increasing mass of medical research publications.

Sometimes it is necessary to recommend actually reading an article yourself because they merit individual and special attention. These "mindstretchers" will not be easy articles; they will not be softened by the process of predigestion that usually accompanies editing. Sometimes articles will be recommended because the contents are very important and on other occasions because the process and methods offer an excellent educational opportunity. Not every "mindstretcher" will be appropriate for every reader - but one will come your way soon enough.

Tests

Diagnostic tests are much more difficult to evaluate than treatments. For treatment the outcome is relatively straightforward, but for a diagnostic test the outcomes are much less straightforward and much more difficult to assess. Different techniques are required to measure the added value that a new diagnostic test offers.

The major review of meta-analyses evaluating diagnostic tests in Annals of Internal Medicine not only describes the meta-analyses included in the reviews but also has an excellent discussion of the criteria used within the reviews and the criteria used to appraise and classify the reviews themselves.

Eleven meta-analyses were found, covering the following tests:

- PET assessment of myocardial perfusion.
- CT to stage lung cancer.
- Fluoroscopy for the diagnosis of coronary artery disease.
- Parathyroid imaging.
- The accuracy and usefulness of thermography for lumbar radiculopathy.
- Assessment of dipstick tests for urinary tract infection.
- A comparison of three different radiological procedures for the detection of lumbar disc herniation.
- Diagnostic significance of carcinoembryonic antigen in the differential diagnosis of malignant mesothelioma.
- Tests for human immunodeficiency virus antibodies.
- Tecnetium venography in the diagnosis of venous thrombosis of the lower limb.
- The reliability of non-invasive carotid studies.

Some of these tests are common and some are rare, but the paper describing their meta-analysis is excellent. It comes from some of the superstars in this field, including Thomas Chalmers and Frederick Mosteller and involves Dr Irwig from the University of Sydney, who has particular exper-

tise in this area. This paper will take you an hour or two, but it offers an excellent opportunity to stretch the mind and extend your education.

Reference:

L Irwig, ANA Tosteson, C Gatsonis, J Lau, G Colditz, TC Chalmers, F Mosteller. Guidelines for meta-analyses evaluating diagnostic tests. Annals of Internal Medicine 1994 120: 667-76.

PREVENTING SUICIDE

"Perhaps the first recorded suicide prevention initiative was that reported by Plutarch (46-110 AD) in the Greek city of Miletus. Here an epidemic of suicide amongst young women is said to have been terminated by the public display of the naked bodies of those committing suicide."

This quote is taken from the highly readable and beautifully written monograph 'The Potential for Preventing Suicide: a review of the literature on the effectiveness of interventions aimed at preventing suicide' by David Gunnell of the Health Care Evaluation Unit in Bristol. This peer reviewed report contains 243 references sources from the medical literature by standard techniques. There are about 50 pages of text and tables, and a few hours of reading brings the problems concerning suicide prevention into stark contrast.

Reducing the rate of suicide in the population by 15% by the end of the decade is one of the targets set for Health of the Nation.

How big is the problem?

In 1991 just under 6,000 people took their own lives and suicide is the second most frequent cause of death in 15-34 year olds. Suicide accounts for 2% of male and 1% of female deaths and 8.5% and 3.8% respectively of years of life lost before age 64 years. Parasuicide (a deliberate non-fatal act) accounts for over 100,000 admissions to hospital in England every year.

Self poisoning by solid or liquid substances was the most common method of suicide in 1991, used in 24% of suicides. Other major methods were carbon monoxide poisoning (mostly from car exhausts) and hanging (each 20%), whilst other methods constituted the remaining 36% (drowning 6%, jumping from a height 5%, jumping from a moving object 4%, firearms 3%, self-burning 2% and others).

Of those who died from self poisoning, 39% took analgesics or anti-rheumatics, while 24% took tranquillisers or other psychotropic drugs.

High risk groups

Suicide risk is increased in males (male suicide rates outnumber female by 3:1) and those who are separated, single or divorced. There are a number of groups of people recognised as having an increased risk of suicide. No more than 1-2% of the members of any of these groups commit suicides in a year, and at least a third of suicides do not belong to any high risk group.

Contact with GPs

About a quarter of those committing suicide have contact with a health care professional (usually the GP) in the week before death, and about 40% in the month before death. However, in a health district of 1,000,000 people there will be 56 suicides in one year. The average GP will experience a suicide in one of his patients once every four or five years, with a patient consulting before this episode only once every eight or nine years.

Potential for prevention

This thoughtful monograph goes into great detail on possible prevention strategies, the evidence that these may actually work, and what research is needed to demonstrate the effectiveness of prevention measures. It points out, for instance, that to show a 15% reduction in suicide rates in the UK would require a study with a population size of 13 million!

A number of probably effective strategies could be put in place now. Most of them are pretty obvious, and include measures such as greater safety measures at suicide 'hot spots', safety measures on underground railways, gun control and the enforced and monitored reporting guidelines to prevent imitative episodes of suicide.

A more significant measure would be changing availability of OTC medicines like paracetamol. Over 200 people die each year from paracetamol poisoning. In France the contents of each pack are limited to eight grams; in 1974-83 there were only 3 deaths from paracetamol overdose, and all three had British packaging of the drug. Similar arguments could be made for changing the design of car exhausts to prevent the attachment of pipes (20% of suicides), and to legislation to ensure that plastic bags have holes (100 suicides a year).

The full list of pragmatic suggestions, with the caveat that further research is required to assess their effectiveness is:-

- Measures to reduce risk of suicide amongst those recently discharged from psychiatric care.
- Limiting quantity and packaging of paracetamol and aspirin.
- Schemes to limit size of individual prescriptions and dose per tablet of high risk drugs.
- GP education on recognition and treatment of depression, highlighting the drugs most often taken in fatal overdoses.
- Regular reminders of media guidelines on the reporting and showing of fictionalised suicide.
- Audit of suicide and parasuicide.
- Strategies/research into means of reducing suicide in those recently discharged from psychiatric care.
- Car exhaust and plastic bag redesign.

Reference:

Copies of "The Potential For Preventing Suicide" can be obtained from Health Care Evaluation Unit, Department of Epidemiology and Public Health Medicine, University of Bristol, Canynge Hall, Whiteladies Road, Bristol BS8 2PR (Fax 01179 238568).

This is one of a series of excellent reviews. Others in the series include:-

Total Hip Replacement
Total Knee Replacement
Hernia Repair
Cataract Surgery
Palliative Cancer Care: Provision in The South West

Respirators and TB protection

Outbreaks of multidrug resistant tuberculosis led the Centre for Disease Control and Prevention in the US to propose using high-efficiency particulate air filters (HEPA respirators) in isolation procedures against tuberculosis. Each HEPA respirator costs 10 times more than respirators currently used.

The University of Virginia Health Sciences have conducted a cost-effectiveness study. They used data from the University of Virginia Hospital on exposure to patients with TB and rates at which the purified-protein-derivative (PPD) skin tests became positive in hospital workers.

In 1992 eleven patients with documented TB were admitted. Eight of 3852 workers (0.2%) had PPD tests that became positive. Five conversions were due to the booster phenomenon, one to unprotected exposure to a patient not yet in isolation, and two more in workers who had never entered a tuberculosis isolation room.

HEPA respirators used for one year would not prevent a single conversion of the PPD test. If one conversion were prevented a year, it would take 41 years to prevent one case of occupationally acquired TB at a cost of $1.3 - $18.5 million. Given the effectiveness of currently recommended procedures to prevent transmission of tuberculosis, HEPA respirators would offer negligible extra protection at great cost.

Reference:

KA Adal, AA Anglim, CL Palumbo et al. The use of high-efficiency particulate air-filter respirators to protect hospital workers from tuberculosis. New England Journal of Medicine 1994 331: 169-73.

Audit watch

Clinicians and Managers agree that audit is both important and necessary. Nevertheless, it has proved extremely difficult to gather useful audit data which can be used to improve service.

The ideal audit system is where the data collection takes place automatically when the service is provided; a simple example is billing in the private sector. Where automatic data collection is not possible a system should gather simple but relevant data at minimal expense.

Experience has shown that data collected by clinicians tends to be incomplete. Clinicians would argue that it is the managers who want the information and it is they who should collect it. If managers are to do this job, then the facts that are collected must be obvious and unequivocal so that they do not require clinical skills to gather or interpret.

Flags

One way to do this is to identify flags which indicate automatically that the standard of care for a particular patients appears to have fallen below standards set by the hospital. Some flags can be general to any patient admitted to hospital, while others can be more specific to specialties or even procedures.

Flags and quality

A patient who is treated in hospital without a flag episode could be used as a mark of good practice and the number of flag-free admissions used as a positive measure of quality in a hospital. Each time a flag is raised then an explanation for this should be found and action taken to prevent it happening again.

The flags presented in the figure relate to admissions for total hip replacement, although six could refer to any elective surgical admission. The key feature of each of the flags is that it is a piece of information which could be collected by a manager on a daily visit to each ward without needing any specialist expertise.

New Flags?

There must be other flags, both general and specific, which are clear, relevant to patient satisfaction and simple to collect. ***Bandolier*** would be delighted to receive and print suggestions.

Source: *lecture notes on "Medicine for Managers - the Scale of the Demand for Total Joint Replacement" given by Mr Chris Bulstrode, Clinical Reader in Orthopaedic Surgery, John Radcliffe Hospital, Oxford.*

Flags: Events which alert to potential falls in standards, and data which should be collected continuously by the clinical audit team

Cancellation

Every cancelled operation is a disaster for the patient and a loss of revenue for the hospital. The cause of cancellation should be determined and measures taken to avoid it occurring again. The patient and his/her doctor should be contacted with an explanation and a new date agreed forthwith.

Collapse

All transfers of patients to intensive care or even the medical wards should be investigated for failures in assessment or management.

Dislocation

All dislocations should be investigated. The cause lies either at surgery (malposition of implants), portering (failure to protect hip during transfer), nursing (failure to turn the patient carefully) or non-compliance of the patient (potential delirium tremens not picked up at pre-assessment clinic).

Infection

Difficult to diagnose as few hips become so grossly infected that they are opened and pus drained. Flag all patients in whom antibiotics are continued for more than three doses (suggesting that there is anxiety in someone's mind about the possibility of infection). Red wounds are usually covered by antibiotics and are picked up as below as the haematoma discharges.

Haematoma

Flag all patients in whom extra blood has to be cross-matched. Flag also patients in whom there is a wound discharge after removal of drains; this may be infection or a large haematoma draining. This may be poor surgery or a complication of anticoagulation.

Bed sores

Sacral or heel sores are unforgivable in elective surgery. They are due to either careless positioning of the patient on the operating table or to poor nursing (failure to turn and respond to red skin).

Discharge date

The median length of stay for a primary hip replacement should be about eight days, and in some units with pre-admission clinics and access to convalescence it will be shorter. Flag all primary replacements where stay is more than 10 days; there is frequently a problem which could have been anticipated.

Re-admission

Re-admission to any hospital within 20 days needs investigation. The GP should be asked to inform the unit if this occurs.

Failure

Failure of the implant can be defined as the date when pain in the joint is the same or worse than before surgery. Any failure in less than five years should be investigated.

READERS' POINTS

Bandolier recognises that there are other points of view to those that appear in these pages, and from time to time we will publish short abstracts of letters we receive from a different perspective. Issue 4 had a short piece on hospital-led prescribing which concluded that there was insufficient evidence to lay the blame for high GP prescribing costs on hospital loss-lead prescribing.

This has brought strong responses from Dr Tom Jones of the Oxfordshire FHSA and Sharon Hart and colleagues from the Bucks FHSA which express concern that this may undermine efforts to persuade hospitals to co-operate in helping GPs toward more cost-effective prescribing. Since there is insufficient space to print the letters in full, the following abstracts are printed with the approval of the correspondents.

- Wiffen & Lauder showed that the cost to the community of a 'basket' of the top 100 drugs by total expenditure was 7% higher than the cost to the hospital pharmacist. This is not insignificant, representing perhaps as much as £250,000 in one quarter in Oxfordshire. In addition, VAT is payable on hospital, but not community, drug costs. Taking VAT out of the equation increases the differential above 7%.

- The comparisons made underestimate the saving potential if alternative drugs were substituted. Thus an Audit Commission Report on prescribing in Buckinghamshire suggested a saving of £220,000 a year if there were full substitution of ibuprofen and naproxen for expensive NSAIDs such as fenbufen and diclofenac. Similar arguments could be used for Co-amilofruse and Co-amilozide being substituted by frusemide and bendrofluazide, and cimetidine for ranitidine.

- Inevitably much GP prescribing is hospital driven, and rightly so, for hospital specialists are experts in the therapy of the conditions they treat. In most cases medicines are recommended solely for therapeutic supremacy.

However, if in even a small number of cases the Hospital Specialist chooses a medicine because of low hospital cost when a therapeutic equivalent would be more expensive *but cheaper in the community*, the community drug bill goes up unnecessarily. In cases like this, it is difficult for GPs to change prescribing when patients on long-term therapy return to the community. It is important to identify those drugs which do have cheaper community alternatives so that savings overall can be made through enlightened purchasing decisions and rational GP prescribing.

Some hospital staff and managers may take the Wiffen & Lauder article to imply that trying to make savings in the community drug bill through attention to hospital prescribing is unnecessary. This is unfortunate since there are a number of hospital initiatives that could reduce community prescribing costs without loss of effectiveness. The NHSE recently arranged a Prescribing conference for purchasers, in part because of this very point.